

OPERATOR'S MANUAL

ExpressCopy

*The Fast, Safe, and Reliable Road
for Hard Disk Backup and Archival*

ExpressCopy

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for Hard Disk Backup and Archival*

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1.0 INTRODUCTION

ExpressCopy (XCO) is designed to rapidly copy directories and files from a source directory path to the destination 3.5" Floppy Disk(s). XCO is unique in that the disks it creates are compatible with either the Standard FileSystem or the Fast FileSystem included with Workbench 1.3. The advantage of XCO is that the disks that it creates have the same directory paths and files as the source directory, and the files can be used normally.

Why is this an advantage? If you use XCO for backing up your HardDisk, and your HardDisk fails for some reason, the files you backed up using XCO could be used normally.

Besides using XCO for backup of your HardDisk, it also comes in handy when you need to copy a large number of files from HardDisk to floppy disk(s).

Search parameters can be specified to limit which files are copied. You can eliminate files which have the archive bit set, files whose DateStamp is prior to a date and/or time you enter, and filenames which do not match a filename pattern you specify. You can also exclude files whose filename matches a filename pattern you specify.

If the source files will not fit on a single disk, you will be prompted for additional disks as needed to complete the copy.

XCO allows you to use up to 4 disk drives to make additional copies of the disks XCO creates when performing a copy.

XCO also allows you to alternate between up to 4 disk drives. Once XCO has begun copying to a disk, it will prompt you to insert disks into any alternate drives it will use. This allows you to pre-load disks so that you will not be bothered as often to feed XCO disks, and speeds up the backup slightly.

XCO will automatically detect, and completely format and verify a new disk. For your protection, you can have XCO ask if you wish to over-write any valid DOS disks you insert.

XCO can also copy files that are larger than a single disk can hold.

XCO also allows you to set the ARCHIVE protection bit of the source files to help make incremental backups easier.

XCO was designed to allow you to multi-task effectively. You can adjust the programs priority while it's running.

You can **HALT XCO** if needed, and use the floppy drives normally. When you **RESUME** copying, XCO will check to make sure the correct disks are inserted, and if necessary, ask you to insert the correct disks.

If XCO comes across a file or directory that it can't access because it is in use, it will give you a chance to finish whatever you were working on, then try to access the dir/file that was in use, or you can skip the dir or file.

XCO can be used from either the CLI or Workbench. XCO also has the ability to load/save configuration files specifying parameters for backups or copies you perform frequently.

ExpressCopy includes the program XCORestore (XCR) for restoring the directories and files on the disks which were created by XCO. You don't have to use XCR for restoring files on disks XCO created. Since XCO creates normal DOS disks, you can use any file copy program to restore XCO backup disks to your HardDisk. The standard CLI commands in your C: directory for copying files, or your favorite Directory Utility program may be used. XCR can make it easier to restore files to your HardDisk, especially if XCO has split files which were too large for a single disk. In that case XCORestore can automatically copy those files to your HardDisk, restoring the original file from the multiple disks upon which the file is stored.

You can have XCR restore only those files whose filename match a specific pattern, or the files on floppy disk which have a more recent DateStamp than those on HardDisk. XCR will automatically prompt you to insert the next sequential disk when restoring a backup that required more than one floppy disk.

For additional confidence in the integrity of the files copied by XCO, you can have XCO list all files copied to a listing file. Not only will the file names be listed, but also all the file attributes and a CRC checksum value. You can then use the program XCOcrc from the CLI to check the integrity of all files on the disks XCO wrote.

The program ArchProt is also included. ArchProt can be used from the CLI to list all the files in a source directory for which the Archive bit is not set. You can also have it set or clear the Archive Bit on files in the source directory.

CAUTION: Any previous data on destination disks used by XCO will be completely lost.

2.0 INSTALLATION

The first thing you should do is make a copy of the ExpressCopy distribution disk and put it in a safe place.

ExpressCopy can be used on all Amigas with at least 512k of memory and Version 1.2 or higher of Kickstart and Workbench. In order for ExpressCopy to be able to perform copies you must have the program **Run** in your assigned C: directory.

2.1 Installation from CLI

The files **XCO**, **XCR**, **XCO.info**, and **XCR.info** on the distribution disk can be copied to the desired directory on your hard disk. The programs **XCOcrc** and **ArchProt** in the C directory on the distribution disk should be copied to your assigned C: directory. The file **Express-Way.XCO** on the distribution disk should be copied to your assigned L: directory.

2.2 Installation from Workbench

XCO can be installed automatically by double clicking on the **InstallXCO** Icon. **InstallXCO** will copy the programs **XCO** and **XCR** to your **SYS:System** directory, the file **Express-Way.XCO** to your assigned L: directory, and the programs **XCOcrc** and **ArchProt** to your assigned C: directory. If you desire XCO to be installed in any directory/drawer other than **SYS:System**, you can move the **XCO** and **XCR** programs to the desired directory/drawer from your **SYS:System** directory/drawer after using **InstallXCO** from Workbench.

3.0 USING XCO FROM CLI

CAUTION: Any previous data on destination disks used for XCO will be completely lost.

All the features of XCO can be used from the CLI. When XCO has been started with valid command arguments, it attempts to start a background program that actually performs the copy. See Section 5.0 for information on the XCO background program runtime environment. If the background program has been started successfully, XCO will return control back to the CLI, leaving the program running in the background, performing the copy. You can even close the CLI window XCO was started from, even though the background program is running.

3.1 Command argument template

The command template uses the following syntax. Any argument in brackets [] is mandatory. Where brackets are used for an argument following an option flag, the argument is mandatory for that option. Arguments in curly braces {} are optional. Options must be specified separately with a '-' immediately preceding. If the option requires any arguments, there must be at least one space between the option flag and the argument, and between arguments. Typing in just XCO will bring up XCO's Intuition user interface.

```
XCO [path] [name] [drive(s)] {options}
    [path]           Source directory path
    [name]           Name for destination volume
    [drive(s)]       Destination 3.5" floppy drive(s)
    {options}        -o [(vsarfcl)] flags to switch an option ON
                     v Verify data written to destination volume
                     s Switch (alternate) destination drives
                     a Exclude files with Archive bit set
                     r Set Archive bit for source files copied
                     f Create Fast FileSystem compatible disks
                     e Estimate number of disks needed for backup
                     l List all files copied to List File
                     c Check Disk and use Overwrite Requester
    -d [date] {time} Exclude files prior to date & time
    -p [pattern]     Exclude files not matching pattern
    -x [pattern]     Exclude files matching pattern
```

or

```
XCO -c [filename]
    -c [filename]    Use parameters in configuration file for copy
```

3.2 Detailed command arguments description

3.2.1 [path]

Mandatory argument describing the source filesystem path; the directory or volume from which the files are to be copied. Must be the first argument following the program name.

3.2.2 [name]

Mandatory argument listing the desired volume name for the destination 3.5" floppy disk(s). Must be the second argument following the program name. Limited to a maximum of 20 characters. The character '/' and colon ':' can not be used in the name. An underscore '_' and a sequential number starting at 1 will be added to the name to create the volume name for the destination disk(s).

3.2.3 [drive(s)]

Mandatory argument listing the 3.5" floppy disk drive(s) to use. Up to four 3.5" floppy disk drives may be used to make multiple copies of the source; or to alternate disk drives. See Section 3.2.4.2 for more information on using the 's' flag to alternate the destination 3.5" floppy disk drives. Must start at the third argument following the program name.

3.2.4 -o [{vsarfelc}]

Flag specifying optional arguments.

3.2.4.1 v

Verify flag, use when verification of the data written to floppy disk is desired. The verify option causes XCO to re-read all data written to floppy to ensure that the destination disk is not corrupt. Use of this option is strongly recommended.

If an error is encountered while verifying the destination disk the user is asked to RETRY or ABORT. If RETRY is selected, the data will be written to disk and verified again. If ABORT is selected, and only one copy of the source is being made, the user will be asked if the copy should be restarted from the beginning of the current Volume (RETRY), or ABORT.

3.2.4.2 s

Switch (alternate) flag, tells XCO to alternate the 3.5" disk drive being used to perform the copy between the disk drives you specify in the [drive(s)] argument. This can be used when the backup will require more than one disk to speed up the backup, and allows you to pre-load disks in the alternate disk drives so XCO will not bother you as often to load disks. While XCO is copying to one disk drive, you will be asked to insert the next disk in the alternate disk drive(s). Requires that at least two 3.5" Disk Drive(s) be specified as the [drive(s)] argument.

3.2.4.3 a

Archive bit flag, excludes files which have the archive bit set from being copied.

3.2.4.4 r

Set Archive bit flag, used when you want the Archive protection bit set on the source files copied. This is useful when you want to perform incremental backups of the same source directory path later.

3.2.4.5 f

Fast FileSystem flag, use this when you want XCO to write floppy disks which are compatible with the Fast FileSystem.

3.2.4.6 e

Estimate flag, use this option when you want XCO to determine the number of disks needed to copy the desired files.

3.2.4.7 l

List flag, used to cause XCO to list all files copied to the Listing File.

3.2.4.8 c

Check flag, use this option when you want XCO to check each disk inserted and display the Overwrite Requester when a standard DOS disk is inserted. The Overwrite Requester will display the Volume Name of the inserted disk and ask if you desire to overwrite the disk so that you can ensure that you don't inadvertently overwrite a disk you didn't want to use.

3.2.5 -d [date] {time}

Date flag, used to specify that all files which have file dates prior to the specified date and/or time should be excluded from the copy.

[date] Mandatory argument for the -d option. The date must be specified in the format dd-mon-yy.

{time} Optional argument for the -d option. The time must be specified in the format hh:mm:ss using a 24 hour clock.

Example: 11-mar-87 22:25:30

3.2.6 -p [pattern]

Pattern flag, used to specify a pattern. Only files matching the pattern will be copied.

[pattern] Mandatory argument for the -p option. A string of characters describing the pattern to match. The string can contain valid characters for filenames and the below special characters. The pattern string can be a maximum of 78 characters.

?	matches any single character except newline
#	zero or more occurrences of following character
%	matches the null string
	or, (a b) = a or b
'	escape (match following special character literally)
'a	any alphabetic character
'd	any digit
'n	any alphanumeric
's	any white space character

Examples:

- #.?(c|asm) Matches any files that have the extension .c or .asm. Such as **test.c** or **mega.asm**.
- test#'d Matches any files named **test** with a number immediately following, such as **test2**, **test45**.
- file? Matches any files named **file** with only one additional character, such as **filea**, **file1**.
- help'?me Matches the file named **help?me**. Notice that the special character ? had to be escaped with the ' character.

3.2.7 -x [pattern]

Exclude pattern flag, used to specify a pattern. Any files matching the pattern will not be copied. [pattern] Mandatory argument for the -x option. The pattern match string is the same as described in Section 3.2.6.

3.2.8 -c [filename]

Configuration file flag, used to tell XCO that you desire the copy to be performed based on the parameters in the configuration file specified by [filename]. When used, this must be the only argument to XCO.

3.3 CLI command examples

XCO DF0: Workbench DF1: -o v

This example shows how to copy the files on the disk in disk drive DF0: to a destination disk in DF1:. The integrity of the data written to the destination disk will be verified. The volume name of the destination disk would end up being **Workbench_1**. This example shows how XCO can be used to create an unfragmented copy of a disk whose files have become fragmented, resulting in slower file access.

XCO DF0: DataDisk DF1: -o f

This example shows how to make a Fast FileSystem compatible copy of the disk in DF0: to the disk in DF1:, which will have the Volume Name **DataDisk_1**. See Section 10.0 for information on using the FastFileSystem of Workbench Version 1.3 with floppy disk drives.

XCO DH0: DH0_BU DF0: DF1: -o sa

This example shows how to copy all files on DH0: which do not have the archive bit set. The destination disks will be named **DH0_BU_X**, where X is the sequential number of the disk. XCO will alternate using Disk Drives DF0: and DF1:, allowing the user to insert the next sequential disk in the alternate Disk Drive while XCO is copying to the other drive.

XCO DHA:Graphics Graphics DF2:

This command would result in the complete contents of the directory **Graphics** on drive DHA: to be copied to destination disk(s) in Disk Drive DF2:. The resulting disks would be named **Graphics_X**, where X is the sequential number of the disk.

XCO DH1:Source Source DF0: DF1: -p #?(c|asm|i|h) -o vsr

This command would copy all files in the source directory DH1:Source which had filenames that ended with either .c, .asm, .i, or .h. The disk drive being used by XCO would alternate between DF0: and DF1:. The resulting disks would be named **Source_X**, where X is the sequential number of the disk. The integrity of the data written to the destination disk(s) will be verified, and the Archive Bit will be set for all files on the source which were copied.

XCO -c swd:source.xco

This command would perform the backup based on the parameters saved in the configuration file **source.xco** on disk volume swd:. The file extension .xco isn't required, but is used only to indicate that the file is a configuration file for use by XCO.

3.4 Error messages from starting XCO

Most of the error messages you can receive when starting a copy with XCO using the CLI are self explanatory. Additional information for some of the error messages you could receive are listed below.

3.4.1 Insufficient Memory

XCO will display this error when you have asked it to start the copy, and the Background Copy Program could not be started successfully because there was insufficient memory for the Background Copy Program. You must have at least 200k of free memory when starting the XCO Background Copy Program.

3.4.2 Startup of Bkgd Copy failed

XCO will display this error when you have asked it to start the copy, and the Background Copy Program could not be started successfully.

This could be caused by not having the program Run in your assigned C: directory.

3.4.3 Incompatible Express-Way.XCO

XCO will display this error when you have asked it to start the copy, and the Background Copy Program Express-Way.XCO is not the same version as XCO.

3.4.4 Could not find Express-Way.XCO

XCO will display this error when you have asked it to start the copy, and the Background Copy Program Express-Way.XCO could not be found. XCO first searches your assigned L: directory, and then the same directory XCO is in for Express-Way.XCO.

3.4.5 Only one XCO copy at a time

XCO can only perform one copy at a time on the Amiga, if XCO is already running, performing a copy, you will receive this error.

3.4.6 Invalid Date String

The Date and/or Time string entered after the -d flag was not in the correct format. Refer to Section 3.2.5 for more information on specifying a DateStamp for selecting which files to copy.

3.4.7 Invalid pattern match string

The pattern match string entered after the -p flag was not in the correct format. Refer to Section 3.2.6 for more information on specifying a pattern match string to be used for selecting which files to copy.

3.4.8 Invalid character In Volume Name string

XCO requires that a valid Volume Name for it to use when creating disks be entered before it can start a copy. Refer to Section 3.2.2 for information on valid Volume Names.

3.4.9 Require at least two floppy disk drives to alternate

If the 's' option is used following the -o flag, you must specify at least 2 Floppy Disk Drives for the [drive(s)] argument.

3.4.10 Could not open file

The configuration file specified following the -c flag could not be opened. Check to make sure the file exists, and that a proper path was used to reach the file from the Current Directory of the CLI where you started XCO.

3.4.11 Could not load valid data from config file

The configuration file specified following the -c flag does not contain valid data for XCO to use in performing a copy or is not compatible with the current XCO Version.

3.4.12 Could not find source directory

XCO could not find the source directory specified in the [path] argument to XCO. You must specify a proper path for XCO to find the source directory from the Current Directory of the CLI from which XCO was started.

3.4.13 Duplicate Floppy Disk Device Units selected

Multiple Floppy Disk Drives were specified for the [drive(s)] argument, and at least 2 of them are the same physical Disk Drive.

4.0 USING XCO FROM WORKBENCH

CAUTION: Any previous data on destination disks used for XCO will be completely lost.

4.1 Setting XCO Default Startup Selections.

When you start XCO from Workbench using the ExpressCopy Icon, XCO looks at the Icon's Info to determine the default settings for XCO.

You can set up your own default settings by editing the ExpressCopy Icon Info. To change your default setup for XCO you need to select the XCO icon, then choose Info from the Workbench menu. The Info for the Icon will be displayed in a window. The following entries can be made for the Icon in the String Gadgets associated with the entry.

The **STACK** entry should be 24000.

The **TOOL TYPE** entries are used to set up your defaults for XCO on startup from Workbench. To change a **TOOL TYPE** entry, click on the up or down arrow gadgets until you see the **TOOL TYPE** entry you wish to edit, or, if it isn't present, select **ADD** to insert a new **TOOL TYPE** entry. The following entries for **TOOL TYPE** can be used for XCO.

FILETYPE=Express-Way.XCO|PROGRAM This entry is mandatory for the XCO program Icon.

DestDrives=DF0:|DF1:|DF2:|DF3: This entry specifies which Floppy Disk Drives you want selected 'DestDrives=' should be immediately followed by each Floppy Disk Drive you want selected. Each Floppy Disk Drive entry must be separated from the next entry by the vertical bar '|' character.

DestFlags=VERIFY|ALTDIVES|ESTIMATE|FASTFS|LIST|CHECK This entry specifies the desired settings for the option Gadgets in the Destination Disk section of XCO. 'DestFlags=' should be immediately followed by each option you want selected. Each entry must be separated from the next entry by the vertical bar '|' character. The entries for DestFlags correspond to the option Gadgets in the Destination Disk section of XCO. The **FASTFS** entry specifies that you desire Fast FileSystem compatible floppy disks created.

SourceFlags=SETA|CHECKA|DATE|PATTERN|EXCLUDE This entry specifies the desired settings for the option Gadgets in the Source File Options section of XCO. 'SouceFlags=' should be immediately followed by each option you want selected. Each entry must be separated from the next entry by the vertical bar '|' character. The entries for SourceFlags correspond to the option Gadgets in the Source File Options section of XCO. The **PATTERN** entry specifies that you desire **INC PAT**, and the **EXCLUDE** entry specifies that you desire **EXC PAT**.

4.2 Starting XCO from Workbench

XCO can be started from Workbench by either double clicking with the left mouse button while the pointer is over the XCO Icon, or over an XCO Project Icon. When you start XCO by using the XCO Icon, XCO will be setup as per your settings in the XCO Icon **TOOL TYPES**. Refer to Section 4.1 on setting up XCO's defaults. If XCO was started with a Project Icon, XCO will be setup as per the settings saved in the Configuration File associated with the Project Icon.

4.3 General Information on using XCO

After XCO has been started successfully, it will display a Window for you to use to make your selections of how you want XCO to perform the Copy. The current Version Number for XCO will be displayed in the Window Title. The Window contains the default System Gadgets for Close, Window Dragging, and the Window Front/Back Gadgets. Refer to your Amiga manual for more information on the System Gadgets.

Any time XCO is busy and doesn't want you to bother it until it's finished the Mouse Pointer will change to a Sleepy Zz Cloud.

The Toggle Gadgets (Gadgets to switch an option on or off) will look like they are raised above the Window surface when **OFF** and will appear to be depressed into the Window surface when **ON**. The text in the Toggle Gadgets will be Black when **OFF**, and White when **ON**. To toggle a Toggle Gadget from one state to another, click on the Gadget with the left Mouse button while the Mouse pointer is over the Gadget.

The String Gadgets are used for entering text that XCO needs for setting up for a Copy. To enter text into a String Gadget, the String Gadget has to be selected first. To select a String Gadget you need to place the Mouse Pointer within the box for the String Gadget, then click the left Mouse button. When a String Gadget is selected, you will see a Cursor inside the box of the String Gadget. When a String Gadget is selected you can use the keyboard to type in the desired text. Refer to your Amiga Owners Manual for more information on editing text in a String Gadget. When you switch ON the DATE or PATTERN Toggle Gadgets, XCO will automatically select the appropriate String Gadget for entering text required for that option.

The validity of text you have entered in a String Gadget will be checked when you type RETURN or ENTER within the String Gadget, and when you tell XCO to perform a Copy or Save the current Configuration. If an error is encountered, an error message is displayed in the Error: box and the String Gadget where the error occurred will be Activated.

4.4 XCO Menu Selections

XCO has one Menu on the title bar, the Project Menu. Each MenuItem under the Project Menu can be selected by using the mouse, or the command key listed in the MenuItem. Refer to your Amiga Manual for more information on using Menu's. The MenuItems available and their use are as follows:

4.4.1 Load

Selecting the Load MenuItem will bring up a File Requester for selecting the XCO Configuration file to load. The information in the configuration file will be used by XCO for setting up the selections for the Backup or File Copy you want to perform. See Section 4.6 for more information on using the XCO File Requester to locate and load an XCO Configuration File. If the file selected does not contain valid Configuration data for XCO, the error "Unable to Load Configuration" will be displayed in the Error: box on the main XCO Window. If a valid Configuration file was selected, the XCO Toggle Gadgets, String Gadgets, and the Current Directory will be changed to reflect the XCO settings contained within the Configuration file.

4.4.2 Save

When you Select the Save MenuItem, XCO will check your current selections in the XCO Window to ensure that all necessary selections and entries have been made. If there are any missing or invalid selections, an Error message will be displayed in the Error: box of the XCO Window. Refer to Section 4.7 for more information on the error.

Once your selections are complete, a file requester will be displayed for saving the configuration file. See Section 4.6 for more information on using the XCO File Requester to save a Configuration File.

4.4.3 Copy

When you Select the Copy MenuItem, XCO will check your current selections in the XCO Window to ensure that all necessary selections and entries have been made. If there are any missing or invalid selections, an Error message will be displayed in the Error: box of the XCO Window. Refer to Section 4.7 for more information on the error.

Once your selections are complete, it will start the XCO Background Copy Program. Refer to Section 5.0 for more information on the XCO Background Copy Program. If the startup of the XCO Background Copy Program failed, an Error message will be listed in the Error: box of the XCO Window. Refer to Section 4.7 for more information on the error.

Once the XCO Background Copy Program starts up successfully, you can start setting up XCO for another Copy, Save or Load Configuration Files, or Quit. But only one XCO Background Copy can be performed at a time.

4.4.4 Copy&Exit

The Copy&Exit MenuItem performs the same actions as the Copy MenuItem of Section 4.4.3 except that if the XCO Background Copy Program was started successfully, the XCO main program will terminate.

4.4.5 Quit

The Quit MenuItem is for terminating the XCO program. A Requester will be displayed asking "Do you really want to Quit?". Selecting YES will tell XCO to terminate, Selecting NO will return you to the XCO Window.

4.5 Setting up XCO for performing a copy

The XCO Window which is displayed after XCO is started contains all the Toggle Gadgets and String Gadgets necessary to make the selections for performing a copy using XCO. The XCO Window is split up into three selection areas as follows:

4.5.1 Source File Options

The Source File Options area contains Gadgets for specifying what operations you want XCO to perform on the Files contained in the Source Directory or Volume, and all the Files in it's Sub Directories. These are the Files that XCO will be copying to Floppy Disk. The CHECK A, DATE, and PATTERN Toggle Gadgets specify requirements for XCO to use in determining what files to Copy. In order for a file to be copied, it must meet all the requirements you specify.

4.5.1.1 SET A Toggle Gadget

Switching the SET A Toggle Gadget ON tells XCO to Set the Archive bit of any files from the Source Directory or Volume which XCO copies to Floppy Disk.

4.5.1.2 CHECK A Toggle Gadget

Switching the CHECK A Toggle Gadget ON tells XCO that it should not copy those files in the Source Directory or Volume for which the Archive Bit is set.

4.5.1.3 DATE Toggle Gadget

Switching the DATE Toggle Gadget ON tells XCO that it should not copy those files in the Source Directory or Volume whose DateStamp is earlier than the Date and Time entered in the Date String Gadget. In order to use this option, you must enter a valid Date and/or Time in the Date String Gadget.

4.5.1.4 Date String Gadget

The Date String Gadget is to the immediate right of the DATE Toggle Gadget. If you plan on using the DATE Source File Option, a valid Date and/or Time must be entered in the Date String Gadget in order to successfully start the XCO Background Copy, or to Save your current selections to a Configuration file.

The Date and/or Time specifies a DateStamp which will be compared against the DateStamp of each file XCO finds. XCO will not copy any files whose DateStamp is prior to the DateStamp you enter in the Date String Gadget. XCO will only check the DateStamp if the DATE Toggle Gadget is ON, and a valid Date and/or Time has been entered.

The Date must be specified in the format dd-mon-yy.

The Time is optional and must be specified in the format hh:mm:ss using a 24 hour clock.

Examples: 25-Jan-87
11-mar-87 22:25:30

4.5.1.5 INC PAT Toggle Gadget

Switching the INC PAT Toggle Gadget ON tells XCO that only those files in the Source Directory or Volume whose filename match the pattern string entered in the Include Pattern String Gadget should be copied.

4.5.1.6 Include Pattern String Gadget

The Include Pattern String Gadget is to the immediate right of the INC PAT Toggle Gadget. If you plan on using the INC PAT Source File Option, a valid pattern string must be entered in the Pattern String Gadget in order to successfully start the XCO Background Copy, or to Save your current selections to a Configuration file.

The pattern is a string of characters describing what filenames XCO should copy based on the pattern you specify. The string can contain valid characters for filenames and the below special characters. The pattern string can be a maximum of 78 characters.

?	matches any single character except newline
#	zero or more occurrences of following character
%	matches the null string
	or, (a b) = a or b
'	escape (match following special character literally)
'a	any alphabetic character
'd	any digit
'n	any alphanumeric
's	any white space character

Examples:

#?.(c asm)	Matches any files that have the extension .c or .asm. Such as test.c or mega.asm .
test#d	Matches any files named test with a number immediately following, such as test2 , test45 .
file?	Matches any files named file with only one additional character, such as filea , file1 .
help'?me	Matches the file named help?me . Notice that the special character ? had to be escaped with the ' character.

4.5.1.7 EXC PAT Toggle Gadget

Switching the EXC PAT Toggle Gadget ON tells XCO not to copy those files in the Source Directory or Volume whose filename match the pattern string entered in the Exclude Pattern String Gadget.

4.5.1.8 Exclude Pattern String Gadget

The Exclude Pattern String Gadget is to the immediate right of the EXC PAT Toggle Gadget. If you plan on using the EXC PAT Source File Option, a valid pattern string must be entered in the Pattern String Gadget in order to successfully start the XCO Background Copy, or to Save your current selections to a Configuration file.

The pattern is a string of characters describing what filenames XCO should not copy based on the pattern you specify. Valid pattern matching strings for Exclude Pattern matching is the same as for the Include Pattern of Section 4.5.1.6.

4.5.2 Destination Disk Options Area

The Destination Disk Options Area contains gadgets for allowing you to specify to XCO what Floppy Disk Drives to use, the Volume Name for the Disks XCO writes, and options for performing the copy to the Floppy Disk Drives.

4.5.2.1 CHECK Toggle Gadget

Switching ON the CHECK Toggle Gadget tells XCO to check the backup disks you insert, and, if a standard DOS disk is inserted display the Overwrite Requester. The Overwrite Requester will display the Volume Name of the disk, and gives you a chance to insert a different disk if you don't desire to overwrite the disk you inserted.

4.5.2.2 OFS/FFS Toggle Gadget

The OFS/FFS Toggle Gadget selects whether you want the disks XCO writes to be compatible with the Normal FileSystem or the Fast FileSystem. When this gadget is OFF, it will say OFS, and tells XCO to write disks compatible with the Normal FileSystem. When this gadget is ON, it will say FFS, and tells XCO to write disks compatible with the Fast FileSystem. Refer to Section 10.0 for more information on the Fast FileSystem.

4.5.2.3 Floppy Disk Drive Toggle Gadgets

Immediately to the right of the OFS/FFS Toggle Gadget is where the Toggle Gadgets are for selecting what Floppy Disk Drives you want XCO to perform the copy to. Only normal 3.5" Disk Drives can be used by XCO, and only those Disk Drives which are installed in your Amiga will be listed. Each Gadget will have the name of the Floppy Disk Drive on it; either DF0:, DF1:, DF2:, or DF3:. Only the Disk Drives whose corresponding gadget has been switched ON will be used by XCO for performing the copy. At least one Disk Drive must be used. Up to 4 Disk Drives can be used to make additional copies of the files being copied.

4.5.2.4 VERIFY Toggle Gadget

Switching **ON** the **VERIFY Toggle Gadget** tells XCO to verify the integrity of every track that XCO writes to disk. Since you may be backing up important files on your HardDisk, use of this option is strongly recommended.

If an error is encountered while verifying the destination disk the user is asked to **RETRY** or **ABORT**. If **RETRY** is selected, the data will be written to disk and verified again. If **ABORT** is selected, and only one copy of the source is being made, the user will be asked if the copy should be restarted from the beginning of the current Volume (**RETRY**), or **ABORT**.

4.5.2.5 ALTERNATE DRIVES Toggle Gadget

Switching **ON** the **ALTERNATE DRIVES Toggle Gadget** tells XCO to alternate which Disk Drive is being used for the copy. While XCO is copying to one disk drive, you will be asked to insert the next sequential disk needed for performing the copy in the next alternate Disk Drive. This option allows you to pre-load additional Disks for XCO to use in the Alternate Disk Drives. This will speed up the copying of files some, and also keep XCO from bothering you as often to feed it Disks. You can Alternate between as many as 4 Disk Drives, but you must select at least 2 Disk Drives.

4.5.2.6 ESTIMATE Toggle Gadget

Switching **ON** the **ESTIMATE Toggle Gadget** tells XCO to determine how many floppy disks will be needed to make one copy of the files meeting your selection criteria. If you are using **ALTERNATE DRIVES** to perform the copy to, using **ESTIMATE** will keep XCO from asking for more Disks than it would need for the copy.

4.5.2.7 LIST Toggle Gadget

Switching **ON** the **LIST Toggle Gadget** tells XCO to list all files copied to a listing file. Refer to Section 6 for further information on use of the listing file.

4.5.2.8 Volume Name String Gadget

The Volume Name String Gadget is located at the bottom of the Destination Disks Options area and immediately to the right of the text 'Volume Name:'. You must enter a Volume Name for XCO to use to name the disks it writes. The length of the name is limited to 20 characters and XCO will not allow the use of leading spaces or either the colon ':' or slash '/' characters in the name. The actual Volume Name that the Disks XCO writes will consist of the Volume Name you entered followed by an underscore '_' and a sequential number starting at 1 added to the end.

4.5.3 Source Directory or Volume Area

The Source Directory or Volume area contains gadgets for selecting the Volume or Directory that you wish to copy. At the topmost of this area is a box labeled CD: where the Current Directory (or Volume) name will be listed. This is the name of the Directory or Volume whose contents would be copied.

The Selection box is used for displaying available Disk Volumes, or the available directories in the Current Directory.

The remaining gadgets are used for selecting the Source Directory or Volume you desire to copy.

4.5.3.1 Viewing the entries in the Selection box

The Selection box can list up to 7 Directories or Volumes. You can use the Scroll Bar to the immediate left of the Selection Box to view any additional entries. Refer to your Amiga Users Manual for more information on using Scroll Bar's. You can also use the Up and Down Arrow Gadgets to the left of the Scroll Bar to move up or down 1 item in the list.

4.5.3.2 Selecting a Volume or Directory

You can use the Current Directory String Gadget located above the Selection box to type in the desired Volume and/or Directory Path. If no CD: is listed you must start with a Volume Name. If there is a CD: listed the entry should be a legal Directory path for the CD:.

You can also move the mouse pointer over the desired Volume or Directory in the Selection box and click the left mouse button twice to change to that directory, or click on it once with the left mouse button to list that directory in the Current Directory String Gadget.

To return to the previous directory you can use the Left Arrow Gadget which is located to the left of the Scroll Bar.

The new Volume or Directory selection will be listed as the CD: and the available directories within that Volume or Directory will be displayed in the Selection box.

4.6 XCO Configuration file Requester

The XCO - Configuration File Select Requester consists of a Title Box at the top which is also used to display errors. The Requester is identical for Load/Save of Configuration Files except that the Text for the Gadget to Load or Save a Configuration File lists the respective text; and for Save, an ICON/NOICON Gadget is also displayed.

4.6.1 Loading and Saving the Configuration File

The Drawer: String Gadget, the Selection box, and the Scroll Bar, Up, Down, and Left Arrow Gadgets work the same as those on the Main ExpressCopy Window with the following exceptions:

A Volume Name will have (VOL) at the end of its name; a Directory will have (DIR) at the end of its name; and Files are listed by name only.

If you wish to exit the Requester select the CANCEL Gadget.

When saving a Configuration File, Toggle the ICON/NOICON gadget to reflect whether you desire an Icon to be created for the configuration file.

To select a configuration file to Load/Save move the mouse pointer over the desired file name in the Selection box and click the left mouse button twice, or you can type the name in the File: String Gadget and hit return. Selecting a file by clicking on the left mouse button once will list the filename in the File: String Gadget. Clicking on the LOAD/SAVE gadget will load or save the file listed in the File: String Gadget

When saving a configuration file, if the file already exists, XCO will display a Requester asking if you wish to Overwrite the file.

4.6.2 XCO Requester Error Messages

If there are any FileSystem errors when XCO attempts to Load/Save a configuration file, they will be displayed in the XCO - Configuration File Select Title Box.

4.6.2.1 Configuration File Open Failed

XCO could not open the file listed in the File: String Gadget. The most likely cause of this is that the file does not exist in the Current Directory or there was a FileSystem Error when trying to Open the file.

4.6.2.2 Configuration File Save Failed

XCO could not Save the Configuration File. Possible causes are that the disk is full, or there was a FileSystem Error when trying to create the file.

4.6.2.3 Name too long to create Icon

When XCO has to create an Icon for the Configuration file, .info has to be added to the filename you have entered in the File: String Gadget. Filenames can be a maximum of 30 characters, so the maximum size the filename you enter in the File: String Gadget can be is 25 characters in order for XCO to be able to create the Icon file.

4.6.2.4 DOS FileSystem Error

This indicates that the DOS FileSystem could not perform the last operation you attempted. A possible cause is that you may not have entered a valid Volume or Directory path for the Current Directory in the Drawer: String Gadget.

4.7 XCO Error Messages

This Section lists all the possible error messages that can be displayed in the Error: box on the XCO window. Each error is explained, and possible causes listed.

4.7.1 Invalid Volume Name

XCO requires that a valid Volume Name be entered before it can start a copy. Refer to Section 4.5.2.7 for information on valid Volume Names.

4.7.2 No Source Directory

XCO requires that a Source Volume or Directory be selected before it can perform a copy. Refer to Section 4.5.3 for more information on selecting the Source Volume or Directory.

4.7.3 Invalid Pattern Match String

If you switched ON the INC PAT or EXC PAT Toggle Gadget to have XCO select/exclude files based on a Pattern Match String, you must have a valid pattern entered in the corresponding Pattern Match String Gadget. Refer to Section 4.5.1.6 for more information on creating pattern match strings.

4.7.4 Can not ALTERNATE DRIVES

If you switched ON the ALTERNATE DRIVES Toggle Gadget you must select at least 2 Destination Disk Drives.

4.7.5 Unable to load Configuration

The Configuration file associated with the Project Icon XCO was started with did not contain valid data for XCO to use in configuring XCO or was not compatible with the current version of XCO.

4.7.6 Can not load Configuration File

The Configuration file selected with the XCO - Configuration File Select Requester did not contain valid data for XCO to use in configuring XCO or was not compatible with the current version of XCO.

4.7.7 DOS FileSystem Error

This error will list the number of a DOS FileSystem Error. Refer to your Amiga Users Manual for more information on the error.

4.7.8 No Destination Drive Selected

You must select at least 1 Destination Disk Drive for XCO to operate.

4.7.9 XCO Bkgd Copy Startup Failed

XCO will display this error when you have asked it to start the copy, and the Background Copy Program could not be started successfully.

This could be caused if there is insufficient memory for the Background Copy Program. You must have at least 200k of free memory when starting the XCO Background Copy Program.

This could be caused by not having the program Run in your assigned C: directory.

4.7.10 Only 1 Bkgd Copy at a time

This error is displayed if an XCO Background Copy is already running. Only one XCO Background Copy can be run at a time.

4.7.11 Incompatible Express-Way.XCO

XCO will display this error when you have asked it to start the copy, and the Background Copy Program Express-Way.XCO is not the same version as XCO.

4.7.12 Could not find Express-Way.XCO

XCO will display this error when you have asked it to start the copy, and it could not find the Background Copy Program Express-Way.XCO. XCO first searches your assigned L: directory, then the directory where XCO resides for the file Express-Way.XCO.

4.7.13 Could not create Config File

XCO was not able to create and Save the Configuration File.

4.7.14 Invalid Date/Time String

If you switched ON the DATE Toggle Gadget to have XCO select files based on the file DateStamp, you must have a valid date and/or time entered in the Date String Gadget. Refer to Section 4.5.1.4 for more information on entering valid date/time strings.

5.0 USING THE XCO BACKGROUND COPY PROGRAM

5.1 XCO Background Copy Window and Gadgets

After XCO has been started successfully, XCO will open a small Window with Gadgets to allow you to control XCO while it is performing the copy.

5.1.1 HALT/RESUME Gadget

When this Gadget displays HALT, clicking on it will stop XCO from copying and the Gadget will change to RESUME. XCO will remain stopped until you click on the RESUME Gadget. This can be used to stop XCO while you perform some other task. While XCO is halted, you can use the floppy disk drives normally. When XCO resumes, it will check to make sure the disks it needs are inserted, and if not, prompt you to insert the appropriate disk(s).

5.1.2 ABORT Gadget

The ABORT Gadget is used to terminate the XCO copy before it has finished. You will be prompted with a Requester asking if you really want to Abort.

5.1.3 PRIORITY Gadget

The PRIORITY Gadget allows you to change the task priority of XCO while it is running. The priority can be adjusted using the Priority Gadget by clicking on the left arrow to reduce the priority, and on the right arrow to increase the priority. XCO will only allow you to adjust priority between -5 and 5.

5.2 XCO Background Copy Requesters

Any time XCO requires a response from the user a Requester will be displayed to prompt the user. If XCO is in use, there will also be an audible beep and a screen flash to notify the user that XCO needs attention. Each Requester that XCO displays is numbered for easy reference. The Requester number is located on the first line of text in the Requester following the name 'Express-Way XCO'.

ExpressCopy 0 - Insert Disk

CAUTION: Any previous data on destination disks used for XCO will be completely lost.

Prompts you to insert the next sequential disk for the destination volume in a specific Disk Drive. The requester can be satisfied by inserting the disk, or clicking on the INSERTED gadget in the Requester. If you desire to abort the copy to this disk drive, click on the ABORT gadget. After insertion of a disk, XCO will check the disk.

If a blank disk, or a NON-DOS disk is inserted, XCO will automatically FORMAT and VERIFY the disk.

ExpressCopy 1 - Over-Write Disk If you have turned ON the CHECK Toggle Gadget or selected the c option flag when starting XCO from CLI, you will get this requester if a disk you inserted is a valid DOS disk. The Volume Name of the disk will be listed, and the requester will ask if you desire to overwrite the disk.

ExpressCopy 2 - Disk Drive Open Fail A specific Disk Drive could not be opened for use. This could be caused by insufficient memory.

ExpressCopy 3 - Volume Write Protect The current disk in a Disk Drive has the Write Protect tab on. You can satisfy this requester by removing the current disk, and inserting a Non Write Protected Disk. Or select the ABORT gadget to abort the copy to the Disk Drive.

ExpressCopy 4 - Verify Fail A track that had been written to disk could not be read and verified. Select RETRY to have XCO attempt to write and verify the track again, or select ABORT to abort the copy to that disk. If ABORT is selected, and this was the only destination disk being written, you will be asked if you wish to restart the copy at the beginning of the current disk.

ExpressCopy 5 - Disk Removed A disk has been removed from a Drive that XCO was writing data to. The copy to the disk will be aborted.

ExpressCopy 6 - Copy to Disk Drive Aborted A copy to a Disk Drive has been aborted.

ExpressCopy 7 - Restart Copy All destination Disk Drives have been aborted. Click on the RESTART gadget if you desire to restart the copy from the start of the current disk, or select ABORT to abort the copy.

ExpressCopy 8 - Check User Abort Displayed to ensure you really want to Abort the copy. Select RETRY to continue the copy, or ABORT if you really want to Abort.

ExpressCopy 9 - Disk Read Error XCO could not read a block from the specified Disk Drive. Select RETRY to attempt the read again, or ABORT to abort the copy to the Disk Drive.

ExpressCopy 10 - Disk Write Error XCO could not write a block to the specified Disk Drive. Select RETRY to attempt the write again, or ABORT to abort the copy to the Disk Drive.

ExpressCopy 11 - Low Memory There isn't enough free memory for XCO to continue the copy. Free additional memory and select RETRY, or select ABORT to terminate the copy.

ExpressCopy 12 - Generic Trackdisk Error XCO encountered an unexpected error from a Disk Drive. Select RETRY to have XCO try to use the Drive, or select ABORT to discontinue the copy to the Drive.

ExpressCopy 13 - Generic DOS FileSystem Error XCO encountered a DOS FileSystem error on the source. Refer to your Amiga Manual for information on the error number displayed.

ExpressCopy 14 - XCO Aborted XCO aborted.

ExpressCopy 15 - File Too Large XCO encountered a file that is too large to fit on one floppy disk. Select SPLIT if you want XCO to split the file between disks, or ABORT if you don't desire to copy the file.

ExpressCopy 16 - File In Use XCO encountered a file to be copied from the Source that is being used by another program. You can finish working on the file and then select RETRY, or you can skip copying the file by selecting ABORT. If ABORT is selected, a message will be included in XCO's list file indicating the file was skipped.

ExpressCopy 17 - File Aborted XCO aborted copying a file from the source. A message will be included in XCO's list file listing the file and why it could not be copied.

ExpressCopy 18 - Dir In Use XCO encountered a directory that it can't access because it is being used by another program. You can finish whatever program was preventing XCO from accessing the directory and select RETRY; or you can select ABORT to skip copying any files and sub directories in the directory. A message will be included in XCO's list file listing the directory and why it could not be copied.

ExpressCopy 19 - Dir Aborted XCO aborted copying a directory of the source. A message will be included in XCO's list file listing the directory and why it could not be copied.

ExpressCopy 20 - Insert Same Disk When you HALT XCO, you can use the Drive(s) that XCO had been using. When you select RESUME, if the exact same disk(s) that XCO had been using are not in the drive(s), XCO displays this requester to prompt you to insert those disks.

ExpressCopy 21 - Estimate If the Estimate Number of Disks option was selected, this requester indicates the number of disks needed for 1 copy of the Source Directory.

ExpressCopy 22 - Copy Complete XCO has successfully completed copying the files from the Source to the destination floppies. The last sequential disk number used will also be displayed.

ExpressCopy 23 - Aborted List File A DOS FileSystem Error prevented XCO from creating or adding to the volume name.XCL list file. You can continue the copy, but the list file will no longer be used.

5.3 How XCO copies files too large for one disk

When XCO encounters a file that is too large to fit on a single floppy disk, it prompts you with a requester asking if you desire to split the file between disks or abort the copy of the file.

If you tell XCO to copy the file, XCO will split the file into multiple files, one file per disk, until it is finished copying the file. The original filename and size for the file will be placed in the Comment field of each split file created, and the split files will be given a unique name. XCR needs this information in order to restore the original file.

The unique name for the split files will consist of the following: XCO_split_file_F#.S# Where F# above is replaced by a sequential number of the number of files which have had to be split for this copy, and where S# is the sequential file number for the split files used to save the original file.

5.4 The XCO list file

If you turn ON the LIST Toggle Gadget, or use the 'l' option for the -o flag, XCO will list all files copied to the list file. See Section 6.0 for more information on using the list file XCO creates.

Anytime XCO cannot copy a file or directory for some reason, the reason will be listed to a listing file so that you can have a record of what files were not copied and why. The error messages will correspond to the Error Requesters you received from the XCO Background Copy program.

The listing file will be located in your S: directory, and the filename will have the following format: volume_name.XCL Where **volume_name** is replaced by the Volume Name you entered for the Destination Disks. This is an ASCII file that can be reviewed using a text editor or listed to a CLI or printer using the TYPE command.

6.0 ADDED SECURITY, XCOCRC AND THE LIST FILE

The XCO list file and XCOcrc program make it easy for individuals using ExpressCopy to verify the backup disks created by XCO at any time following the backup. These checks provide added security, especially if you are going to reformat your HardDisk and restore the files from the Backup Disks to the HardDisk. You can select this feature with the 'l' option to the -o flag from the CLI, or by switching ON the LIST Toggle Gadget in the XCO Window.

When you tell XCO to LIST files copied to list file, XCO creates the list file in your S: directory. Section 5.4 explains how XCO names this file. Each file XCO copies will be listed in the following format:

"Name_X:Dir/File" prot_bits filesize date time CRC "comment"

Name_X:Dir/File	Name is the volume name for the destination disk(s) created by XCO, and X is the disk's sequential number. Dir is the path to the file to be checked from the Source Directory or Volume. File is the name of the file which was copied.
prot_bits	Protection bits of the original source file.
filesize	Flesize of the original source file.
date time	DateStamp for the original source file.
CRC	CRC checksum value calculated for the source file.
comment	Comment listed for the original source file.

To check the integrity of the disks created by XCO, use XCOcrc from the CLI as follows, where list file is the name of the list file XCO creates:

XCOcrc S:list file

Example: XCOcrc S:HD.XCL. HD is the destination name you gave XCO, and .XCL is the extension XCO added to identify it as a list file.

The XCOcrc integrity check can be done anytime after a Backup. Everything XCOcrc needs is in the list file, and it will automatically ask for any disks it needs to check. Once started, XCOcrc will check each file listed in the list file, making sure all the file attributes match. It then will calculate a CRC checksum for the file on floppy and compare it to the CRC entry listed in the list file which was calculated from the original file that was backed up. Errors XCOcrc encounters will be printed to the CLI where you started XCOcrc.

7.0 RESTORING FILES USING XCORESTORE (XCR)

7.1 General information on using XCR

XCR can be used to restore all files from a series of sequentially numbered Backup Disks created by XCO. It will create any directories necessary to contain the files, and all files are restored with the file attributes the original file had when backed up. You can restore a single directory, Disk, or Sequential series of Disks XCO created. Files which were too large for a single disk, and had to be split up and placed on multiple disks, are automatically joined together to create the original file. Note that the file comment for a file which had to be split between disks is not restored. You can have XCR check to see if the file it's restoring already exists, and only restore the version of the file on the backup disk if it has a more recent DateStamp than the destination file. You can also have XCR restore only those files whose filename matches a pattern match string you specify. And finally, you can tell XCR to restore multiple sequential disk volumes that XCO created so XCR only has to be started once to restore a series of Backup disks.

7.2 Using XCR from the CLI

The command template uses the following syntax. Any argument in brackets [] is mandatory. Where brackets are used for an argument following an option, the argument is mandatory for that option. Arguments in curly braces { } are optional. Options must be specified separately with a '-' immediately preceding. If the option requires any arguments, there must be at least one space between the option flag and the argument, and between arguments. Typing in just XCR will bring up XCR's Intuition User Interface. Refer to Section 7.3 for information on using XCR's Intuition User Interface. Refer to Section 7.4 for information on using XCR while it is restoring files.

XCR [source directory/volume] [destination directory] {flags}

- l List files copied or directories created
- n Copy only those files on source newer than on destination
- p [pattern] Pattern match flag
- m Multiple Source Disks

7.2.1 [source directory/volume]

This is the name of the directory or volume whose files you want XCR to restore to the destination directory. If you desire XCR to restore a series of disk volumes which were created by XCO, you must enter the volume name of the first disk you want restored, and use the -m flag.

7.2.2 [destination directory]

This is where you want XCR to restore the files. This must be a directory path that can be reached from the Current Directory of the CLI from which you started XCR.

7.2.3 {flags}

7.2.3.1 -l

List flag, tells XCR to list all files copied, and any directories created to the CLI window XCR was started from.

7.2.3.2 -n

Newer flag, tells XCR to see if the file to be restored already exists on the destination, and if it does, only restore the file if the DateStamp of the file on the Backup disk is more recent than the DateStamp of the file on the destination.

7.2.3.3 -p

Pattern match flag, used to specify a pattern match string for XCR to use in determining which files to restore to the destination. This is the same as the pattern match used for XCO. Refer to Section 3.2.6 for detailed information on using the pattern match flag.

7.2.3.4 -m

Multiple disk flag, used to tell XCR to restore a series of sequentially numbered backup disks. When using this flag, the [source directory/volume] must be the Volume Name of the first disk from which to start restoring files.

7.2.4 Examples

XCR Source_1: DH0:source -m -n -l

This would restore all the directories and files on Volume Source_1: to the directory source on Volume DH0:. Any directories on Source_1: that do not exist in the destination directory DH0:source will be created. Only those files in Source_1: whose DateStamp are more recent than the DateStamp of the corresponding file on the destination DH0:source will be restored. Any directories created, and all files restored are listed to the CLI window where XCR was started. After XCR completes the restoration of Volume Source_1: it will ask for the next sequential backup disk volume (Source_2:) to be inserted. XCR will continue to ask for each sequential disk in the backup until you select CANCEL on the System 'Insert Volume' Requester.

XCR Source_1:mylib DH0:source/mylib -n

This would restore all the directories and files from the directory **mylib** on Volume **Source_1:** to the directory **DH0:source/mylib**. Only those files whose DateStamp is more recent than the corresponding files in the directory **DH0:source/mylib** are restored.

7.2.5 Error Messages from starting XCR from CLI

Most of the error messages you can receive when starting XCR using the CLI are self explanatory. Additional information for some of the error messages you could receive are listed below.

7.2.5.1 Can not use device name as source for multiple volumes

A floppy disk device name such as **DF0:** was entered for the [source directory/volume]. When using the **-m** flag to XCR, the [source directory/volume] must be a sequentially numbered disk Volume name, such as **Source_1:**.

7.2.5.2 Could not open Intuition Library

XCR requires Version 1.2 or higher of AmigaDOS and the system libraries.

7.3 Using XCR from Workbench

7.3.1 Starting XCR from Workbench

XCR can be started by double clicking with the left mouse button while the pointer is over the XCR Icon. When XCR has been started, a window will be displayed for you to use in specifying the file restoration to perform. If XCR fails to start, check to make sure that the STACK entry for the XCR Icon (using Info from Workbench) is at least 18000.

7.3.2 XCR Menu Selections

There is only one Menu for XCR. The Project Menu, with the following Menu Items.

7.3.2.1 Restore

The Restore Project Menu Item starts the restoration of the files from the Source Directory or Volume to the Destination Volume or Directory.

Your selections for the file restore will be checked. Any errors in your entries will be displayed in the Error: box. Refer to Section 7.3.7 for detailed information on errors you receive.

The XCR Window will close once the Restore has been started successfully. Refer to Section 7.4 for information on using XCR while files are being restored.

7.3.2.2 Quit

The Quit MenuItem is for terminating the XCR program. A Requester will be displayed asking "Do you really want to Quit?". Selecting "YES" will tell XCR to terminate, selecting "NO" will return you to the XCR Window.

7.3.3 Current Directory Selection

The Current Directory Selection area of the XCR Window is identical to the Source Directory or Volume area of the XCO Window. Refer to Section 4.5.3 for more information on selecting directories. The Volume or Directory displayed to the right of the CD: box is considered your Current Directory.

7.3.4 Source Volume or Directory

This area is used for selecting the Source Volume or Directory. This is the Volume or Directory that contains the sub directories and files you want restored to the destination.

To select the Source Volume or Directory you have to make the desired Volume or Directory the Current Directory. Refer to Section 7.3.3 on selecting a Current Directory. Once the desired Source Volume or Directory is listed as the Current Directory, click on the SET Gadget with the left mouse button to make the Current Directory the desired Source Volume or Directory.

7.3.5 Destination Volume or Directory

This area is used for selecting the Destination Volume or Directory. This is the Volume or Directory where the files will be restored to.

To select the Destination Volume or Directory you have to make the desired Volume or Directory the Current Directory. Refer to Section 7.3.3 on selecting a Current Directory. Once the desired Destination Volume or Directory is listed as the Current Directory, click on the SET Gadget with the left mouse button to make the Current Directory the desired Destination Volume or Directory.

7.3.6 Restore Options

7.3.6.1 NEWER FILES Toggle Gadget

Switching ON the NEWER FILES Toggle Gadget tells XCR to only restore those files on the Source whose DateStamp is more recent than the corresponding file on the Destination.

7.3.6.2 MULTIPLE DISKS Toggle Gadget

Switching ON the MULTIPLE DISKS Toggle Gadget tells XCR that you desire to restore a series of sequentially numbered Disk Volumes which had been created by XCO. The Source must be a a sequentially numbered Disk Volume.

7.3.6.3 LIST Toggle Gadget

Switching ON the LIST Toggle Gadget tells XCR to list any directories which had to be created, and all files copied. If XCR was started from Workbench, the listing will go to the XCOREstore List Window. If XCR was started from the CLI the listing will go to the CLI where XCR was started from.

7.3.6.4 PATTERN Toggle Gadget

Switching the PATTERN Toggle Gadget ON tells XCR that only those files in the Source Volume or Directory whose filename match the pattern string entered in the Pattern String Gadget should be restored.

7.3.6.5 Pattern String Gadget

The Pattern String Gadget is to the immediate right of the PATTERN Toggle Gadget. If you plan on using the PATTERN Restore Option, a valid pattern string must be entered in the Pattern String Gadget in order to successfully start the restore.

The pattern is a string of characters describing what filenames XCR should restore based on the pattern you specify. Refer to section 4.5.1.6 for information on entering a pattern match string.

7.3.7 XCR Error Messages

This Section lists all the possible error messages that can be displayed in the Error: box on the XCR Window. Each error is explained, and possible causes listed.

7.3.7.1 No Source Vol/Dir Selected

A Source Directory or Volume has to be SET for XCR to restore files.

7.3.7.2 No Destination Vol/Dir Selected

A Destination Directory or Volume has to be SET for XCR to restore files.

7.3.7.3 Invalid Pattern Match String

If you switched ON the PATTERN Toggle Gadget to have XCR select files based on a Pattern Match String, you must have a valid pattern entered in the Pattern Match String Gadget. Refer to Section 7.3.6.5 for more information on creating pattern match strings.

7.3.7.4 Invalid Multiple Disk Source

In order for XCR to restore multiple sequential disk volumes, the Source Directory or Volume must be a sequentially numbered Disk Volume which had been created by XCO.

7.3.7.5 DOS FileSystem Error

This indicates that the DOS FileSystem could not perform the last operation you attempted. A possible cause is that you may not have entered a valid Volume or Directory path for the Current Directory. Refer to your Amiga Users Manual for more information on the error.

7.4 Restoration of files by XCR

During restoration of files all messages from XCR will be displayed to the CLI Window where XCR was started from, or if XCR was started from Workbench, in a console Window named 'XCORestore List'.

The first thing you will see is the following welcome message: XCO Restore Version 1.10 Copyright © 1989 Express-Way Software, Inc.

After displaying this message, XCR will start the file restoration. If XCR encounters any problems trying to start the file restoration, an error message will be displayed to the Window, and file restoration will be aborted. Refer to Section 7.4.1 for more information on the startup error.

XCR will now start copying the files from the source to the destination. If listing was selected; all files copied and any directories created on the destination will be displayed to the Window.

Any errors encountered while restoring files will be displayed to the Window, and you may get a Requester asking "Error during restore, Continue?". XCR will attempt to continue the file restore if you select YES, and will abort the file restore if you select NO. Refer to Section 7.4.2 for more information on XCR file restore errors.

Typing a CTRL-C while the Window XCR is using to display messages is active will abort the file restore after XCR finishes the current file being restored. A CTRL-C is done by typing the letter c while the CTRL key is held down.

7.4.1 XCR file restore startup errors

7.4.1.1 Invalid pattern match string

This error will only be given if an invalid pattern match string was entered as an argument to XCR from the CLI. Refer to Section 3.2.6 for information on entering a valid pattern match string.

7.4.1.2 Could not access Destination Directory

The Destination Directory does not exist, or could not be found from the Current Directory.

7.4.1.3 Insufficient memory for performing copy

XCR could not obtain enough memory for performing file restoration. Free additional system memory, and attempt to restart XCR.

7.4.1.4 Destination is not a Directory

The Destination must be a Volume or Directory, not a File.

7.4.1.5 Could not access Source Directory

The Source Directory or Volume does not exist, or could not be found from the Current Directory.

7.4.1.6 Source must be a Volume or Directory

The Source can not be a File, it must be a Volume or Directory.

7.4.1.7 Identical Source and Destination Directory Paths

XCR will not allow you to copy from and to the same directory.

7.4.1.8 Destination Directory is Inside Source Directory

Copying to a Destination Directory that is a sub directory of the source could cause an infinite copy loop.

7.4.2 XCR file restore errors

7.4.2.1 Restoration of Split File Incomplete, Deleting file:

When XCR is finished restoring files, it checks to make sure any restoration of split files has been completed. Any split files which did not completely restore the original file will cause XCR to delete the incomplete original file on the destination.

7.4.2.2 Insufficient Memory to Continue Copy

During the file restore XCR needed additional memory from the system and could not obtain it. The restore will have to be restarted after freeing additional system memory.

7.4.2.3 Insufficient memory to copy Directory:

XCR needed additional memory for restoring the displayed directory which it could not obtain from the system. XCR will abort the restoration of the displayed directory and try to continue with the next.

7.4.2.4 Could not Find Source Directory:

XCR could not find the displayed directory on the Source.

7.4.2.5 Could not Examine Source Directory:

XCR found the displayed Source Directory, but a FileSystem Error prevented further examination of the Directory.

7.4.2.6 Could not Create Destination Directory:

The displayed Destination Directory did not exist, and XCR could not create it on the Destination. One possible cause is that the disk Volume may be full.

7.4.2.7 Could not change Protection bits of Destination file:

The protection bits of the file restored by XCR could not be set to those of the original file.

7.4.2.8 Could not change Comment of Destination file:

The original Comment for the file could not be restored.

7.4.2.9 Could not set Date of Destination file:

The original DateStamp for the file could not be restored.

7.4.2.10 Could not open Source File:

The displayed File was found, but a FileSystem Error prevented the file from being opened.

7.4.2.11 Could not open Destination File:

A FileSystem Error prevented the destination file from being opened or created.

7.4.2.12 Could not append File:

A FileSystem Error prevented XCR from opening and appending the next sequential split file in re-creating the original file.

7.4.2.13 Error reading source file:

There was a FileSystem Error when reading the Source File.

7.4.2.14 Error writing destination file:

There was a FileSystem Error when writing the Destination File.

7.4.2.15 Could not Examine Destination File:

The Destination File was found, but access to it was prevented by a FileSystem Error.

7.4.2.16 Could not access Destination File, Removing File:

The Destination File written could not be further accessed, so the Destination file was deleted.

8.0 USING ARCHPROT FROM THE CLI

ArchProt is a small program you can use from the CLI to list all the files in a Source Directory and its sub directories for which the Archive Bit is clear. Optionally you can have ArchProt set or clear the Archive Bit on all the files.

8.1 ArchProt Command Template

ArchProt [source directory/volume] {flags}

- l List all files for which the Archive Bit is clear
- c Clear the Archive Bit on all files
- s Set the Archive Bit on all files

8.1.1 [source directory/volume]

This is the name of the directory or volume whose files you want ArchProt to check.

8.1.2 {flags}

8.1.2.1 -l

List flag, tells ArchProt to list all files for which the Archive Bit is clear in the Source Directory and its sub directories.

8.1.2.2 -c

Has ArchProt clear the Archive Bit on all files in the Source Directory and its sub directories.

8.1.2.3 -s

Has ArchProt set the Archive Bit on all files in the Source Directory and its sub directories.

9.0 TIPS AND TRICKS FOR USING EXPRESSCOPY

9.1 Splitting up a HardDisk into multiple areas for backups

It can not be stressed enough that properly organizing your hard disk will make using it, and maintaining backups of your hard disk easier. Making just one backup of the entire hard disk isn't very flexible for performing the backups and especially when de-fragmenting your hard disk, or restoring a backup.

I have found that over 25% of my hard disk is comprised of 'static' files (files that don't change much). Segregating them into separate directories or partitions means that you only have to perform an initial full backup of them, then only an infrequent incremental backup if you have added or changed some of the 'static' files.

I also use partitions or directories to segregate between different types of data, maintaining a separate backup for each type. For instance I used a separate directory to contain all the files necessary for writing the program ExpressCopy. I maintained a separate set of backup disks just for my programming environment. Since the files changed frequently, I would perform a full backup of that directory several times a day. It only required a few disks, and with ExpressCopy, only took a few minutes.

I also used ExpressCopy to make a full copy of my programming environment when a new version of the program was generated. Those disks would be set aside so I could refer back to that version of the program at a later time if needed. And since ExpressCopy creates Normal DOS disks, the backup disks could be inserted and used normally.

Segregating your hard disk into several areas so that each area can be backed up separately allows you flexibility on how you perform backups. There may be times when you work in one area more than another. You can then perform backups on each area as often as necessary, without having to backup the entire hard disk. Also, if a disaster happens, and your hard disk is not available, the backup disks are better organized, and would be easier to use until your hard disk is repaired.

9.2 Incremental Backups

An incremental backup is when you perform a backup of only those files which have changed since the last backup you performed. Initially you would do a full backup of all desired files, setting the Archive bit. These disks would be set aside until you did your next full backup.

There are two methods which can be used for performing the incremental backup, depending on your needs.

The first method is used when you don't want to maintain copies of any previous versions of a file. Use a separate set of disks for the incremental backup and have

ExpressCopy Check the Archive bit to determine which files to copy. Initially, not many files would have changed since the full backup, and only a few disks would be needed. Continue doing your incremental backups like this until the number of disks needed warrant doing another full backup. Or, you could perform an incremental backup, using the Check Archive bit option, to copy only those files which have changed; and Set the Archive bit of those files copied. This second set of backup disks should be set aside with the original full backup.

The second method is used when you desire to maintain copies of previous versions of the files. For this method, you would have to use different disks for each incremental backup you perform. You would perform the incremental backup using the Check Archive bit option so that only those files which have changed are copied. You would also use the Set Archive bit option so that on your next incremental backup, only those files which have changed since this one are copied. Once the backup is complete, the disks would have to be set aside with the originals.

Using XCORestore (XCR) can make it much easier to restore incremental backups to the hard disk. You would start restoration with the most recent set of incremental backups, using the Newer option so that only those files on the backup disks which are more recent than the ones on hard disk are restored. You would continue to do this for each set of incremental disks, until the disks for the original full backup are restored.

9.3 Using an AmigaDOS script for automating backups

When you have data that needs to be backed up frequently during the day, you may want to create an AmigaDOS script that will automatically start ExpressCopy to remind you to do the backup. Here is an example script of how you might do this:

```
; Script for doing backups of ExpressCopy development directory
; at four hour intervals
;
Wait 240 min           ; Wait 4 hours before starting ExpressCopy
XCO -c swd:XCO_bu.xco ; Start XCO using the config file XCO_bu.xco
run execute S:XCO_bu.s ; Restart this backup script
```

The script file is named **XCO_bu.s** and is in the **S:** directory. You would start this script by placing the command:

```
run execute S:XCO_bu.s
```

in your startup-sequence. The script **XCO_bu.s** would then be started running in the background. It would Wait 4 hours, then start ExpressCopy with the command **XCO -c swd:XCO_bu.xco**. ExpressCopy would start up and use the parameters in the configuration file **XCO_bu.xco** in volume **SWD:** for the backup. Notice how the file extension **.xco** is used to indicate that it is an XCO configuration file. The **.xco** file extension isn't required, but helps identify that it is a configuration file for XCO. The configuration file is setup to perform an incremental backup of the directory **SWD:XCO**. Once the backup has been started, the script will execute the command **run execute S:XCO_bu.s** to once again start the script in the background. Then the current script will terminate.

10.0 USING A FLOPPY DRIVE WITH THE FAST FILESYSTEM

NOTE: The Fast FileSystem is only available with release 1.3 or later of Workbench.

10.1 Description

The Fast FileSystem is an alternate to the normal DOS FileSystem used prior to Workbench 1.3. It was developed to improve the performance of Amigas that use Hard Disks. Approximately 5% more data can be stored under the Fast FileSystem than the normal FileSystem.

10.2 Installing the Fast FileSystem for Floppy Use

To use the Fast FileSystem with a Floppy, you have to MOUNT a Floppy Disk Device using a MOUNTLIST entry configured for it.

Example MOUNTLIST entry:

```
FF2:   Device = trackdisk.device
       Unit = 2
       Flags = 0
       FileSystem = L:FastFileSystem
       Surfaces = 2
       BlocksPerTrack = 11
       Reserved = 2
       LowCyl = 0 HighCyl = 79
       Mask = 0x7FFFFF
       GlobVec = -1
       Buffers = 30
       BufMemType = 3
       DosType = 0x44F5301

#
```

The above example is set up for Disk Drive 2 (DF2:). To setup a MOUNTLIST entry for a different Disk Drive, just replace the 2 in the Device Name FF2: and the Unit number entry in the MOUNTLIST, with the appropriate Disk Drive number.

Also, if you have installed the 1 Meg Fat Agnus Chip, you can change the Mask entry to 0xFFFFF.

To install a Floppy Disk Device that can use the Fast FileSystem, add the appropriate MOUNTLIST entry to your MOUNTLIST. Then from the CLI type **MOUNT FFX:** where X corresponds to the Disk Drive to be mounted in your MOUNTLIST.

10.3 Using a Fast FileSystem Mounted Floppy Disk Drive

NOTE: The following discussion refers to Disk Drive DF2: which has the Fast FileSystem Device FF2: mounted as in the Example in Section 10.2.

A Floppy Disk Drive can be used both with the normal DOS FileSystem and the Fast FileSystem, just by using the appropriate Device Name. In the above example, to use the Disk Drive with the Normal FileSystem, access it as DF2:. To use it with the Fast FileSystem, access it as FF2:. Remember, the FileSystems are not compatible with each other. So DF2: would not be able to use Disks that were used with FF2:, and normal FileSystem disks that DF2: can use, can not be read by FF2:. One other problem to note, is that with Workbench 1.3, Fast FileSystem compatible disks are not recognized automatically by the Amiga. In order for you to use a Fast FileSystem disk, you must issue the command **DiskChange FF2:** from the CLI after inserting the disk.

NOTE: XCO recognizes Fast FileSystem disks automatically. The diskchange command isn't necessary for using XCO. You don't even need the Floppy Disk Drives mounted for the Fast FileSystem to have XCO create Fast FileSystem compatible disks. XCR uses the FileSystem to access the files saved on disk. If you create Fast FileSystem compatible disks with XCO then you have to mount and use a disk drive as described in this section in order to use or restore those disks.

11.0 LIMITATIONS

11.1 FileSize

ExpressCopy has the same limitations as the DOS FileSystem in regards to the maximum size file that can be stored on a floppy disk. The maximum size file is limited to approximately 880k. If any files are encountered that are too large, a File Too Large Requester will be displayed, notifying you that the file is too large to fit on a single disk. XCO will allow you to split the file between disks. Refer to Section 5.3 for more information on how files are split.

11.2 Floppy Disk Drives

ExpressCopy can only use standard Amiga 3.5" 880k Floppy Disk Drives for writing the destination disks.

11.3 Multiple Copies of Source

When using more than one destination Disk Drive to make multiple copies of the source directory, only one type of Amiga DOS FileSystem can be used.

11.4 Overwrite of Destination Disk(s)

Any Disk that XCO writes to will be completely over-written. Any previous data on the disk will be lost.

11.5 Multiple execution of ExpressCopy

Only one XCO and XCO Background Copy Program can be run at a time. If you try to start more than one of each of these, the program will fail to start.

11.6 DiskChange detection of Fast FileSystem Floppy Disks

Although the Fast FileSystem can be used with Floppy Disks if you have release 1.3 of Workbench, the Amiga will not automatically detect that a Fast FileSystem formatted Floppy Disk has been inserted in a Disk Drive. In order for the Amiga to recognize that it has been inserted, the DiskChange CLI command has to be used from a CLI prompt.

12.0 GLOSSARY

absolute block number Blocks are numbered in different ways when looked at by the disk controller or AmigaDOS. Absolute block numbers refer to the way AmigaDOS looks at block numbers, numbering them from zero to the highest numbered block on the disk.

AmigaDOS That part of the Amiga's operating system that is concerned with input/output operations to devices.

backup To make copies of files on a hard drive, in case you lose data through a program or hardware error. See also: restore.

BitMap A special set of sectors on a disk that tell AmigaDOS which blocks are free, and which ones already contain data.

bootable Able to be booted from. A disk must be bootable if it's in DF0: when the system is reset.

buffer An area of memory set aside to hold data. In hard drive terminology, can be a temporary data block holding area, or an area that keeps specific data types (directories for example), so that the drive need not be accessed to retrieve it.

CRC checksum A calculated value for a block of data (or file) that is unique for that data. Any changes to the data would change the calculated checksum.

CLI Command Line Interface. One of the Amiga user interfaces. It is a text-only interface where you type in commands for the Amiga.

cursor A cursor is a special character which indicates where you are when typing text in a text editor, String Gadgets, or in a CLI or Shell.

cylinder A group of tracks that can be accessed without moving the head/arm assembly.

DateStamp As used in this manual, the Date and Time a file was last modified. Also referred to as a TimeStamp.

directory The blocks of a disk dedicated to linking all the files into an organized structure so that they can be found by the user or system.

driver The software that actually manipulates the hardware, under the direction of another program or the file system software. Provides translation of logical block numbers to cylinder, head, and sector information for use by the drive controller.

environment The way a system is set up, in terms of current directory, assignments, devices available, and so on.

file attributes All of the information the Amiga file system maintains concerning a file. This includes the DateStamp, File size in bytes, status of the protection bits, and the File comment.

fragmented Split up, as when a file occupies blocks separated by many cylinders on a disk.

integrity For purposes of this book, refers to the accuracy of the actual data in a file, unchanged from the way it was recorded.

partition An area on a disk that is treated as a separate device. Also, to split a disk logically into separate areas to be treated as a separate device.

path In this manual, a string of text specifying where AmigaDOS would find a directory or file. The path tells AmigaDOS where to find a file from your Current Directory. The path may consist of a Volume or Assigned name, directory and subdirectories, and finally the file name.

rename An AmigaDOS command that will change the name of a file. The name includes directory information, so it is possible to rename a file such that it is effectively moved to another directory, which is quicker than doing a COPY followed by a DELETE. Files may only be renamed if they are within the same logical device, or partition.

restore To put files back onto a hard drive from a set of backup disks.

root The 'home block' on a disk partition. It is kept approximately halfway between the first block and the last block of a partition. All directories, subdirectories, and files on a valid AmigaDOS disk partition can be found via links starting at the root block.

Script An ASCII file containing one or more commands that can serve as input to the Execute program. The commands will be treated in the same way as if you had typed them into a CLI.

sectors Areas on a disk in which information is stored. There are usually a fixed number of sectors per track. Also refereed to as blocks. Sectors are normally 512 bytes long on the Amiga.

Shell A CLI-style interface that usually provides extra functionality or features to make CLI easier to use.

startup-sequence A special script file that is executed during the process of booting the machine. A script file that is in the S: directory, and called startup-sequence, will be executed on boot up.

subdirectory A directory within a directory.

thrashing Rapid seeking to different areas of the disk, as might happen when two widely separated files are being alternately accessed.



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